

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex LIBRIS
UNIVERSITATIS
ALBERTAEANAE



For Reference

NOT TO BE TAKEN FROM THIS ROOM



Digitized by the Internet Archive
in 2020 with funding from
University of Alberta Libraries

<https://archive.org/details/JVincent1968>

THE UNIVERSITY OF ALBERTA

STAGE DEVICES IN ARISTOPHANES

BY



JANET ELIZABETH VINCENT

B.A. 1967, UNIVERSITY OF READING

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF CLASSICS

EDMONTON, ALBERTA

AUGUST, 1968

1968 (5)
231

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to
the Faculty of Graduate Studies for acceptance, a thesis entitled

STAGE DEVICES IN ARISTOPHANES

submitted by Janet Elizabeth Vincent in partial fulfilment of the
requirements for the degree of Master of Arts.

ABSTRACT

The purpose of this thesis is to describe what is known and knowable about the stage machinery used in the Greek theatre of the fifth century B.C., with sole reference to Aristophanes and the use he makes of the devices in his comedies. Later evidence has been taken into consideration, though part, at least, of this must be rejected as unreliable testimony for the fifth century.

ACKNOWLEDGEMENT

I should like to thank Dr. Edward C. May for his help and encouragement during the supervision of this thesis.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
II. THE EKKYKALMA IN ARISTOPHANES	2
III. LATER EVIDENCE ON THE EKKUKLEMA	10
IV. THE MHXANH IN ARISTOPHANES	21
V. LATER EVIDENCE ON THE MECHANE	30
VI. THE PURPOSE AND EFFECT OF THE DEVICES IN ARISTOPHANES' COMEDIES	40
VII. CONCLUSION	45
DIAGRAMS	46
BIBLIOGRAPHY	48

CHAPTER I
INTRODUCTION¹

The purpose of this thesis is to examine certain extracts from the comedies of Aristophanes in order to discover what we can about the stage-machinery at his disposal in the fifth century B.C., the *εικόνιλημα* and the *μηχανή*, and for what purpose and to what effect Aristophanes used them.

The passages in his comedies where obvious allusions to the devices occur will be closely analysed to find out all possible details pertaining to the nature and function of the machines.

Ancient evidence of a later date, that of the scholiasts and lexicographers, will also be considered. Where it corroborates and confirms facts specified or hinted at in the primary sources, it may be accepted. Reservations may be made about the validity of any apparent evidence which contradicts the irrefutable evidence found in Aristophanes. Since the scholiasts and lexicographers lived some time after the plays of Aristophanes were produced, it is possible, even to be expected, that the theatre and its machinery had undergone substantial modifications since the Classical period, to which we are confined within the scope of this thesis. To what period of development of the theatre some of our later sources refer cannot be known for certain.

¹Throughout this thesis, 'skene' refers to the stage-buildings directly behind the acting-area and orchestra.

CHAPTER II
THE EKKYKALHMA IN ARISTOPHANES

The text of the plays of Aristophanes is the most reliable source of information on the ekkuklema,¹ since only in the text can be found references which can be definitively dated to the fifth century B.C.

Forms of the verbs ἔγκυκλεῖν, ἔσκυκλεῖν, and ἔκκυκλεῖν occur in several passages of Aristophanes,² not all of which, however, require the use of any form of stage machinery. The passages that reveal facts about the ekkuklema include Acharnians vv. 408-9 and Thesmophoriazusae vv. 95-6 and v. 265.

The Acharnians (vv. 407-411) reads:

Εὐ. ἀλλ᾽ οὐ σχολή.

Δι. ἀλλ᾽ ἔκκυκλήθητ'. Εὐ. ἀλλ᾽ ἀδύνατον. Δι. ἀλλ᾽
ὄμως.

Εὐ. ἀλλ᾽ ἔκκυκλήσομαι. ηαταβαίνειν δ' οὐ σχολή.

Δι. Εὐριπίδη, Εὐ. τί λέλακας; Δι. ἀναβάδην ποιεῖς,
ἔξὸν ηαταβάδην; οὐκ ἔτὸς χωλοὺς ποιεῖς.

Eur. But I haven't time.

Dic. But be circled out. Eur. Impossible.

Dic. Oh, go on.

Eur. Okay, then, I'll circle myself out; but
I haven't time to come down.

Dic. Euripides ... Eur. What are you babbling about?

Dic. Why do you compose upstairs? No wonder you
create lame people!

Dicaeopolis visits Euripides to borrow some tattered clothes from him. He begs Euripides first of all to hear him (Ὕπάκουσον, v. 405),

¹Hereafter the device will be given its transliterated form.

²Acharnians 408, 409. Thesmophoriazusae 95, 96, 265. Wasps 395, 699, 1475.

but Euripides says he has not the time. When Dicaeopolis entreats him to be circled out, he says at first that that is impossible. But upon Dicaeopolis insisting, Euripides condescends to circle himself out, though remarking that he has not time to come down and out of his house — he is in the process of composing a tragedy. Instead, he is revealed by means of the ekkuklema. The scene continues, Euripides remaining on the ekkuklema throughout, with Dicaeopolis successfully effecting a loan of tattered clothing and various other articles. Finally, Euripides has enough of Dicaeopolis' importunity, and terminates the scene (v. 479) by retreating into his house.

From this scene certain facts can be inferred with regard to the ekkuklema.

1. It carries Euripides at a higher level than Dicaeopolis. Euripides emphasizes the fact that he has not time to descend, *καταβαίνειν*, and he is referred to as being *ἀναβάδην*. These two words indicate that a) Euripides is carried on a kind of platform and that b) the platform part of the ekkuklema represents the floor of the upper storey of a house. Alternatively, if it is allowed that the Greek theatre of the fifth century B.C. had a raised stage, then this scene could be played with Dicaeopolis on the orchestra level and Euripides on the stage. This interpretation would still take into consideration the two different levels. The question of whether or not there was a raised stage at this period is insoluble.¹

¹For recent discussion on the subject of a raised stage, see P.D. Arnott: Greek Scenic Conventions, (Oxford: Clarendon Press, 1962), pp. 1-40 and N.C. Hourmouziades: Production and imagination in Euripides, (Athens: Greek Society for Humanistic Studies, 1965), pp. 58-74.

I prefer the first of these two alternatives, since I do not believe there was a high raised stage in the Greek theatre in the fifth century B.C.

2. The ekkuklema brings Euripides into view from being inside his house (Ἐνδον v. 399).

3. The verb used to describe the motion by which Euripides appears is ἐκκυκλεῖσθαι which must mean "to be circled out."¹ Therefore the implications are a) that Euripides is circled out on something, and b) that the something itself, in coming out, described a circle, or part of a circle.

4. If, therefore, the machine is to be "circled out" from the wall of the skene, it seems that a section of the wall with some kind of platform attached to form the ekkuklema would be the only logical solution. This whole section could circle out² through an angle of 180°, or even 360°

¹The base form *κυκλεῖν* is defined by M. Frisk, (Griechisches Etymologisches Wörterbuch, Heidelberg: Carl Winters Universitätsverlag, 1960. s.v. *κυκλέω*) and E. Boisacq (Dictionnaire étymologique de la langue grecque, Heidelberg: Carl Winters Universitätsbuchhandlung, 1938. s.v. *κύκλος*) as "to turn in a circle," "to make turn in a circle." Consequently, it can be deduced from these basic meanings that the compound forms of the verb, viz. *ἐγκυκλεῖν*, *ἐκκυκλεῖν* and *ἐσκυκλεῖν*, should signify respectively "to turn in a circle or make circle while in (a) place," "to circle out of (a) position," and "to circle into (a) position." It should be noted that the notion implied by *κυκλ-* seems to be that of "circle" rather than of "wheel."

The noun *ἐκκύκλημα* is derived from *ἐκκυκλεῖν* as *ποίημα* is from *ποιεῖν* and *μήμα* from *μετάσθαι*. The suffix - μα attached to a verb-stem denotes the object in which the process is incorporated. Thus the noun *ποίημα* signifies the object realised by the action of the verb *ποιεῖν* (P. Chantraine: Etudes sur le vocabulaire grec, Paris: Librairie C. Klincksieck, 1956, p. 20). Similarly, an *ἐκκύκλημα* must denote the object which is circled out. On the basis that *ἐκκυκλεῖν* means "to circle out" rather than "to wheel out," there is inherent in the use of the device some form of revolving motion.

²See fig. 1.

on completing the movement, to disclose an interior scene and the inner surface of the wall, previously hidden from the audience's sight.¹ In this case, in the Acharnians, the part of the section of the wall representing the setting would be the upper part, since Euripides is most probably revealed, as seen above, in the upper storey of his house. The entire section of the wall could be worked by a pivot in the middle of it.² In fact, Rogers translates the verb *ἔκκυκλεῖν* as "pivot" in vv. 408 and 409.

5. There is no definite indication to identify the person who actually hands over to Dicaeopolis the articles he requests. It could be Cephisophon, but since he was previously on 'ground' level, as opposed to the level of Euripides, this would mean he had to climb or reach up in order to take the various items off the ekkuklema, for it appears that Euripides has the items to hand. However, Euripides could have with him on his appearance on the ekkuklema either one or a number of slaves.³ It

¹As described by C. Exon: "A new theory of the ekkuklema," Hermathena XI, 1900, pp. 132-143. (Reviewed by O. Navarre, REA 1901, pp. 102-3).

²Ibid., pp. 134-6; the alternative conception of the ekkuklema would be simply a trolley on wheels pushed through one of the doors in the skene - thus Hourmouziades op.cit., and A.M. Dale, "Seen and unseen on the Greek Stage: a study in scenic conventions," WS 1956, pp. 96-106.

Dale says (p. 98, footnote 4) "I assume that no such elaborate machinery as that of a turning or pivoting platform was in use in the fifth century." But if the Lion Gate at Mycenae, which dates several centuries further back than the ekkuklema, worked on a pivot, why not the ekkuklema in the theatre of the fifth century B.C.?

³K.J. Dover, "The skene in Aristophanes," PCPhS 1966, No. 192, pp. 2-17. "When a comedy represents a man in a situation in which, if it belonged to real life, the man would have a slave with him, we may take it for granted that the character in the play has a slave with him, and that the words of the text will refer to the slave's existence only if and when it is dramatically necessary or convenient." (p. 5).

is possible that Euripides, and/or Cephisophon, and/or a slave or slaves were responsible for handing the different articles to Dicaeopolis. In v. 432 Euripides bids a boy, either Cephisophon or a slave, give Dicaeopolis Telephus' rags. Cephisophon's *ἴδοὺ ταυτὶ λαβέ* of v. 434 does not prove that it was he who actually handed the garments to Dicaeopolis any more than Euripides' *δώσω* of v. 445 implies that Euripides himself was the giver. He is only the giver insofar as he is giving up (temporarily or otherwise) ownership of the articles.

6. The ekkuklema itself must have been of a reasonable size, since it is clear that it carried Euripides, a chair or couch or something for him to sit on (unless he composed sitting on the floor, which seems unlikely), several miscellaneous properties, and probably one or more servants.

The relevant passage in the Thesmophoriazusae reads:

Ετ. σίγα. Μν. τί δ' ἔστιν; Ευ. Ἀγάθων εξέρχεται.

Μν. οὐαὶ ποῖός ἔστιν; Ευ. οὗτος οὐκκυκλούμενος.

Μν. ἀλλ' ἡ τυφλὸς μέν εἰμ'. ἔγὼ γὰρ οὐχ ὅρω ἀνδρός οὐδέν' ἐνθάδ' ὅντα, Κυρήνην δ' ὅρω.

Eur. Be quiet. Mn. What's up? Eur. Agathon's coming out.

Mn. What kind of a man is he? Eur. There he is, being circled out.

Mn. Am I blind, then? I don't see any man there, I see a Cyrene.

In this situation, Euripides and Mnesilochus are on their way to visit another tragic poet, Agathon. When they reach his house, Agathon makes his appearance, "being circled out." The scene continues until after Agathon makes his exit (at v. 265) with the words:

εἴσω τις ὡς τάχιστά μ' ἐσκυνλησάτω.

Someone circle me in as quickly as possible.

During the course of the scene Euripides does not succeed in persuading Agathon to speak on his behalf at the Thesmophoria festival, but he does manage to borrow some articles of clothing by means of which Mnesilochus can be disguised as a woman.

From this passage it can be noted that:

1. Agathon is circled out at v. 96 and circled back in at v. 265.
2. There is no reference made to anyone descending or ascending, or being unable to do so. This silence does not necessarily exclude the possibility of the platform part being on a higher level; but I infer that the ekkuklema represents in this instance the interior of a room on the ground floor of a house.
3. There is, on the ekkuklema, a *κλινίς* (v. 261).
4. As in the Acharnians, several items, clothes and other things, change hands during the scene. Twice Euripides is told, apparently, to help himself to the articles he requires: vv. 219-220

... αὐτὸς λάμβανε
ἐντεῦθεν ἐκ τῆς ξυροδόνης.

Take it yourself out of the razor-case.

and v. 261

Ευ. φέρ' ἔγκυνλον. Αγ. τουτὶ λάβ' ἀπὸ τῆς
κλινίδος.

Eur. Bring a cloak. Ag. Take that one from the couch.

If, however, Euripides had servants with him, and if Agathon had servants with him as well, then it is possible that all the exchanging of articles was performed by the servants. On the other hand, there is nothing to suggest that Agathon himself does not hand things to Euripides, particularly since there is no indication of a difference of level between the two. The only exception to this would be v. 238 where Euripides specifically calls to someone to bring out a torch "from inside" - *Ἐνδοθεύ*. Here, a slave may simply have brought out a torch through a door in the wall adjoining the ekkuklema. Even if he had emerged on a slightly lower level than that on which Agathon, on the ekkuklema, was situated, it seems most unlikely that anyone in the audience would seriously have questioned the fact that it was from within Agathon's house that the slave was coming. Alternatively, one of the slaves on the ekkuklema with Agathon may have run off the platform, through a nearby door, and out again onto the platform, without the action seeming out of place.

It can be concluded from the passages in these two plays that the ekkuklema was used to represent either ground floor or second floor of a house, depending upon the particular situation.

There is one further instance in Aristophanes, where the verb *ἐγκυηλεῖν* is used with possible reference to the ekkuklema,¹ viz. Wasps v. 1475.

¹It should be pointed out that there are two other verses in the Wasps, vv. 395 and 699, where *ἐγκυηλοῦσθαι* and *ἐγκυηλεῖν* are used respectively: v. 395

δαίμων τις ἐσκενύνλην ἐς τὴν οἰκίαν.

Some power has circled into the house.

Nothing more can be learnt from this line than is already known of the ekkuklema from the Acharnians and the Thesmophoriazusae. It does, however, imply that:

1. ἐσκενύνλεῖν could be used of someone or something entering a house.
2. Whereas ἐκενύνλημα was the name by which the device was known when it was circled out from the skene, ἐσκενύνλημα could be the name by which it was called when it was circled into the skene, i.e., out of view of the audience, and in the reverse direction to that of the ἐκενύνλημα.¹

ὡσπερ φωνή μέ τις ἐγκενύνλωται
"It's just as if a voice encircled me."

vv. 698-9

σκέφαι τοίνυν ὡς ἐξόν σοι πλουτεῖν, καὶ
τοῖσιν ἀπασιν ὑπὸ τῶν ἀεὶ δημιζόντων οὐκ
οἶδ', ὅπη ἐγκενύνλησαι.

"Consider how, even though you could all be rich,
you're hemmed in on all sides by demagogues."

In neither of these cases could the verbs be interpreted as referring to stage machinery, so they are not examined in the main body of this thesis.

¹For the noun forms, see infra, p. 16.

CHAPTER III
LATER EVIDENCE ON THE EKKULEMA

Later sources of evidence on the ekkuklema fall into three categories:

- A. Archaeological remains
- B. Scholia
- C. Lexicographers

A. Archaeological remains.

Archaeology gives little support to our knowledge of the ekkuklema derived from the text of Aristophanes. The only suggestion of any assistance to our enquiry is the discovery by Fossum of a set of grooved tracks in the theatre at Eretria,¹ which he claims formed the eiskuklema referred to by Pollux.²

Fossum's theory, however, is dubious proof for the kind of machine he suggests, since

1. he translates the sentence in Pollux "ἐφ' οὐ δ' εἰσάγεται τὸ ἐκκύκλημα, εἰσκύκλημα ὄνομάζεται"³ as "That upon which it [sc. the ekkuklema] moved was called eiskyklema"; and his entire theory is based on this translation. It appears, however, from etymological reasoning,⁴ that an eiskuklema should be "something which is circled in." I therefore believe that the basis of Fossum's theory is mistaken;

¹A. Fossum, "The eiskyklema in the Eretrian theatre," AJA 1898, 187-194.

²See infra, section C 1.

³Pollux Onomasticon IV 128.

⁴See supra, p. 4.

2. the theory rests entirely on a statement in Pollux, whose work cannot be regarded as evidence for the theatre of the fifth century B.C.;
3. it cannot be regarded as by any means certain that the remains of the theatre at Eretria date as far back as the fifth century;
4. even if there were tracks existing in the fifth century B.C., as Fossum posits, it cannot be concluded without further evidence that they were used for the propulsion of an ekkuklema of the type he assumes, viz. a trolley on wheels pushed out in a straight line through a door in the skene.¹

B. Scholia

The scholia on both tragedy and comedy of the fifth century B.C. yield some information about the ekkuklema.² However, since it is only Aristophanes with whom we are concerned here, this enquiry into the scholiasts' comments is restricted to the sphere of comedy.

The relevant passages are remarks on:

1. Acharnians v. 408.

¹It should be pointed out that in JHS 1957, p. 207, A.M. Dale remarks that "one of the few fixed points in fifth century archaeology on the site [sc. of the theatre of Dionysus at Athens] is the reinforced area in the centre of the flooring (marked T in Pickard-Cambridge's diagrams) where this frequently used contrivance slid in and out." The idea that the area named was used for this purpose remains conjecture only — see Pickard-Cambridge, The Theatre of Dionysus at Athens, Oxford: Clarendon Press, 1946), pp. 22-23.

²In fact no further details can be learned about the ekkuklema from the scholia on tragedy than from those on comedy. The relevant scholia are those on Eumenides v. 64; Choephoroi v. 973; Ajax v. 346; Hippolytus v. 171.

ἀλλ' ἐκκυκλήθητι: Εἰ μὴ σχολὴν ἔχεις κατελθεῖν,
ἀλλ' ἐκκυκλήθητι, τουτέστι συστράφητι. ἐκκύκλημα
δὲ λέγεται μηχάνημα ξύλινον τροχοὺς ἔχον, ὅπερ
περιστρεφόμενον τὰ δοκοῦντα ἔνδον ὡς ἐν οἰκίᾳ
πράττεσθαι καὶ τοῖς ἔξω ἐδείκνυε, λέγω δὴ τοῖς
θεαταῖς. Βούλεται οὖν εἰπεῖν ὅτι κανερὸς
γενοῦ. διὸ ἐπήνεγκεν
ἀλλ' ἐκκυκλήσομαι, καταβαίνειν δ' οὐ σχολή.

Well, be circled out: If you have not time to come down, then be circled out, that is, be revolved. Ekkuklema means a wooden device with wheels, which revolved and showed things apparently inside going on in a house to those outside too, that is, to the audience. He means, then, "make yourself visible."

Therefore he subjoined:

Okay, then, I'll circle myself out, but I haven't time to come down.

This passage corroborates what we know from the text of Aristophanes about the ekkuklema being a machine which revolved. We are also informed by the scholiast here that the machine was comprised of a wooden platform on wheels — the presence of wheels does not necessarily contradict the notion of the machine working on a pivot¹ — and that its purpose was to show out of doors that which was actually happening indoors. So far, then, the scholium does not contravene any ideas derived from the text.

2. Thesmophoriazusae v. 96.

ἐπὶ ἐκκυκλήματος γὰρ φαίνεται.

He appears on the ekkuklema.

This passage gives no information further than that the ekkuklema was employed at this juncture—again, corresponding with the knowledge gleaned from the text.

¹See fig. 2.

3. Thesmophoriazusae v. 277.

ὠθεῖται τὸ ἱερόν: παρεπιγραφή. ἐκκυκλεῖται
ἐπὶ τὸ ἔξω τὸ Θεσμοφόριον.

The temple is pushed (out/forward?): marginal note.
The Thesmophorion is circled out to the outside.
(i.e., on stage)

There is no indication in the text at this point to suggest the use of the ekkuklema. The marginal note¹ uses the verb ὠθεῖται which has no apparent connection with ἐκκυκλεῖν. The verb ὠθεῖται, however, does not exclude the use of the ekkuklema. Whether the ekkuklema was simply a platform wheeled out in a straight line from the skene, or, whether it was, as I believe, circled out, in either case it must have been pushed³ in some way by some person or persons, presumably stage-hands. Hence the verb ὠθεῖν could be applied in the case of the ekkuklema, though it indicates only part of the machine's action.

What actually happens in the context is that the scene changes from being merely a street in Athens to being the place where festival of the Thesmophoria is held — viz., the Pnyx. There are several verbal indications in the text to this effect: vv. 277-8, where Euripides remarks that the signal for the festival is being hoisted; the fact

¹It is not certain how or when the παρεπιγραφή originated.

²See footnote on etymology, p. 4.

³Unless it was pulled out; but there is no basis for this assumption, whereas we do find the verb ὠθεῖν used.

that Mnesilochus thereupon immediately adopts his womanly role, addressing an imaginary slave-girl, remarking upon the shining torches, and praying to the two goddesses. I believe that these references would have sufficed to indicate to the audience that the setting was now altered. The alternative to this idea would be to assume the use of the exostra here.¹

4. Clouds v. 184

ὅρᾳ δὲ ὡς φιλοσόφους κομῶντας, στραφέντος τοῦ
ἐγκυνηλήματος.

He sees them dressed as philosophers when the enkuklema² revolves.

Here again there is no specific indication in the text about the employment of the machine. However, the basic situation is parallel to that of the scenes in the Acharnians and Thesmophoriazusae where the ekkuklema was employed, viz., someone on stage wishes to see someone or something off stage, or inside (vv. 181-183):

Strepsiades:

ἄνοιγ' ἄνοιγ' ἀνύσας τὸ φροντιστήριον,
καὶ δεῖξον ὡς τάχιστά μοι τὸν Σωκράτη.
μαθητιῶ γάρ. ἀλλ' ἄνοιγε τὴν θύραν.

Quick! Open up! Open the Phrontisterion, and show me Socrates as quickly as possible. I'm dying to learn. Do open the door!

— and his desire is fulfilled. It therefore seems likely that the machine was involved in this scene. Its use does not contravene any

¹On the exostra, see infra, sec. C.

²It is doubtful whether the scholium originally read ἐκκυνηλήματος or ἐγκυνηλήματος. In any case, the latter noun probably refers to the machine in its position behind the front wall of the skene.

specification in the text, and the scholium again corroborates what we may presume from the text, and once again emphasizes the revolving motion of the machine.

It should be observed that sources such as the scholia cannot be taken as definite evidence *per se*, since the date at which they were written can be fixed only conjecturally.¹ Provided that they corroborate what contemporary fifth century evidence we possess, they may be regarded as valid sources of information; but if any statement found in them openly refutes information from a more direct, ancient source, their reliability as testimony for the conditions of the fifth century theatre should be queried.

C. Lexicographers

Of these there are three who speak of the *ekkuklema*. Their testimony should be included at this point, even if only to be rejected.

1. Pollux (second century A.D.)

In Book IV of the Onomasticon notice is found of several stage devices. The *ekkuklema* is mentioned in IV 127 together with other appurtenances of the theatre, and it is described in some detail in IV 128, as follows:

τὸ μὲν ἐκκύνλημα ἐπὶ ξύλων υφηλὸν βάθρον,
ψὲπίκειται θρόνος. δείννυσι δὲ τὰ υπὸ σκηνὴν ἐν
ταῖς οἰκίαις ἀπόρρητα πραχθέντα. οὐδὲ τὸ ρῆμα τοῦ
ἔργου οὐδεῖται ἐκκυνλεῖν. ἐφ' οὐδ' εἰσάγεται τὸ

¹The scholia on fifth century B.C. tragedy and comedy can be traced back to the first century B.C. See O.C.D. s.v. Scholia.

ἐνηύηλημα, εἰσηύηλημα ὄνομάζεται. οὐαὶ χρὴ τοῦτο νοεῖσθαι οὐαθ' ἐκάστην θύραν, ἵν' ἡ οὐαθ' ἐκάστην οἰκίαν.

The ekkuklema is a high platform on wood on which stands a chair;¹ it shows the unspeakable deeds committed indoors behind the skene. The term for this operation is "to circle out." When the ekkuklema is brought in it is called an eiskuklema. It should be thought of as standing by each door, so that there would be one for each house.

Pollux's description of the ekkuklema contradicts what we know of the machine of the fifth century B.C. from Aristophanes in the following ways:

- a) Pollux specifies a high platform. It has been demonstrated² that the ekkuklema need not have been raised in the case, at least, of the Thesmophoriazusae.
- b) He specifies that the machine was used to show ἀπόρρητα προχθέντα — unspeakable deeds. The events of the Acharnians and the Thesmophoriazusae shown by means of the machine cannot by any stretch of the imagination be classified as such. Pollux may have been thinking here of the use of the machine in tragedy, but even if so, the statement is a sweeping generalisation.
- c) There is no need in any play for more than one machine — Pollux mentions one at each door, which implies a minimum of two.

It seems, then, that Pollux's testimony serves to confuse rather than to clarify the issue, and that his statements with regard to the fifth century ekkuklema are valueless.

¹Not necessarily, as Arnott (op.cit., p. 79) translates, a throne.

²Supra, chap. II.

The machine is further mentioned in IV 129,¹ where it is identified, by some people, with a device known as the exostra. Another reference to this device occurs in a Delian inscription of c. 274 B.C.,² which vouches for its use as a theatrical term. The relevant section of the inscription deals with the cost of construction, or maybe restoration, of various parts of the theatre building:

... καὶ τὰ ἔξωστρα καὶ τὴν κλίμακα καὶ τοῦς βωμοὺς ἐπισκεύασαι.

... and to restore/construct the exostra and the ladder and the altars.

It should be noted that here exostra is used as a neuter plural noun, whereas in our other, later, sources it is found as a feminine singular noun.³ In the face of so little evidence it is impossible to decide which is the more correct form. No definition of the exostra is extant. The only knowledge to be gained of the nature of this machine is derived from the etymology of the term exostra. The word must derive from ἔξωθεῖν to push out, just as δαιτρός from δαιώ, and λατρός from λάοματι. What can be inferred, if anything, from the suffix -τρα or -τρον? Benveniste⁴ suggests that to give the suffix -τρο on the label of "nom d'instrument" would be too precise.

¹τὴν δ' ἔξωστραν ταῦτὸ τῷ ἐκκυκλήματι νομίζουσιν.
"Some people consider that the exostra is the same as the ekkuklema."

²IG. XI², 199. A 94-5.

³Pollux, op.cit., IV 129. Polybius XI, 6. 8.

⁴Benveniste, E. Origines de la formation des noms en Indo-Européen (Paris, Librairie d'Amérique et d'Orient. Adrien Maisonneuve, 1962), p. 109.

"La thématisation produit une individualisation de la notion, soit active pour le masculin, soit passive pour le neutre." He therefore cites δαιτρός to mean "partageur" and δαιτρόν to mean "chose partagée, part." If we apply such a criterion to the word exostron, we could fairly say that it means "something which is pushed out." However, we are still in a quandary as to the possible overtones of a feminine ending in -τρα, the form found in Pollux. In default of further evidence, I think we may reasonably infer from its etymology that the exostra was something pushed out from within the skene.¹ A passage in Cicero² implies that it was perhaps a platform on which someone or something could be shown to public view, as opposed to "post siparium," "behind the curtain," that is, in private.

Certainly the two machines appear to have had this much in common, that both came out from within the limits of the skene; but there is no notion of circling inherent in the term exostra, although such a notion is not excluded. As far as we can tell, the ekkuklema and the exostra were two distinct devices, possibly used for a similar purpose; and it can be concluded that there seems to be no reason for the identification of the one with the other.

2. Clement of Alexandria (second century A.D.)

A scholium on Protrepticus chapter I, section 11, line 14 reads:

¹i.e., probably, a platform on wheels.

²Cicero, De Prov. Cons. 14. iam in exostra helluatur, antea post siparium solebat. (of Piso).

έκκυνλήσω: έγκυνλημα ἐνάλουν σκεῦός τι ὑπότροχος ἐκτὸς τῆς σκηνῆς, οὗ στρεφομένου ἀδόκει τὰ ἔσω τοῖς ἔξω φανερὰ γίνεσθαι. έγκυνλήσω οὖν ἀντὶ τοῦ φανερώσω, γυμνώσω.

διεξοδιηώτερον δὲ περὶ τοῦ αὐτοῦ εἰπεῖν, έγκυνλημα ἐλέγετο βάθρον ἐπὶ ξύλων υφηλῶν, ὃ ἐπίκειται θρόνος. δείκνυσι δὲ τὰ ὑπὸ τῆς σκηνῆς ἐν ταῖς οἰκίαις πραχθέντα ἀπόρρητα.
(etc., exactly as in Pollux IV, 128).

I shall circle out: they called an enkuklema a sort of device on wheels outside the skene which, when it revolved, seemed to make things happening inside visible to people outside. I shall circle in¹ is therefore substituted for I shall make visible, reveal.

To speak in more detail about this: an enkuklema was a platform on high uprights on which there was a chair; it shows unspeakable deeds committed indoors, behind the skene.

It is immediately obvious on reading this passage that the scholiast here has plagiarized from the scholium on Acharnians v. 408 or vice-versa and, even more heavily, from Pollux. The passage is therefore of little or no value for our purpose.

3. Hesychius (probably c. fifth century A.D.)

All we find here is a definition of the exostra as ἐπὶ τῆς σκηνῆς τὸ ἐκκύνλημα. Hesychius too may have gleaned his definition from Pollux.

In summary: there is very little evidence later than the fifth century B.C. which adds to the information derived from the text of Aristophanes. The scholia serve to corroborate deductions made from

¹This must be a slip -έγκυνλήσω should refer to the machine being within the skene. Besides, it is έκκυνλήσω on which the scholiast is supposedly making the comment.

the text, the lexicographers and archaeological remains afford little help; if anything, they confuse rather than clarify the issue.

CHAPTER IV

THE ~~ΜΗΧΑΝΗ~~ IN ARISTOPHANES

As in the case of the ekkuklema, evidence on the nature of the mechane¹ contemporary with its use in the fifth century is non-existent. There are, however, several references in both tragedy and comedy of the fifth century B.C. to a machine such as the mechane is said to have been in later sources.² In four of the complete extant plays of Aristophanes and in one play of which there remain only fragments, there are obvious allusions to a machine which was used to raise people from ground level so that they appear to be flying or hanging in the air.

The passages, in chronological order, are:

Daedalus. fr. 188³

Ὄ μηχανοποιός, ὅπότε βούλει τὸν τροχὸν
ἰμᾶν ἀνεκάς, λέγε, χαῖρε φέγγος ἡλίου.

Machine-operator, when you wish to raise and lift the wheel, say "hail, light of the sun."

This passage implies:

1. that a wheel of some kind was part of the machine;
2. that the machine was used to raise someone or something from the ground into the air;
3. that the character speaking here would appreciate a cue from the operator of the machine to warn him of his impending ascent.

¹Hereafter the transliterated form will be used.

²e.g. Pollux IV 128; Suidas s.v. ἐώρημα; and see infra, chap. V.

³Theodorus Kock, ed., Comicorum Atticorum Fragmenta (Leipzig: B.G. Teubner, 1880), I, p. 436.

Clouds vv. 218-230

Στ. φέρε τίς γὰρ οὗτος οὐπὶ τῆς ιρεμάθρας ἀνήρ;
Μα. αὐτός. Στ. τίς αὐτός; Μα. Σωκράτης. Στ. Ὡ
Σώκρατες.

ἴθ' οὗτος, ἀναβόησον αὐτόν μοι μέγα.
Μα. αὐτὸς μὲν οὖν σὺ οὐλεσον. οὐ γάρ μοι σχολή. 220
Στ. Ὡ Σώκρατες,
Ὡ Σωκρατίδιον.

ΣΩΚΡΑΤΗΣ

τί με οὐλεῖς ὥφήμερε;
Στ. πρῶτον μὲν ὁ τι δρᾶς ἀντιβολῶ οὐτειπέ μοι.
Σω. ἀεροβατῶ οὐλεῖς περιφρονῶ τὸν ἥλιον. 225
Στ. ἔπειτ' ἀπὸ ταρροῦ τοὺς θεοὺς ὑπερφρονεῖς,
ἀλλ' οὐκ ἀπὸ τῆς γῆς, εἴπερ; Σω. οὐ γὰρ ἂν ποτε
ἔξηντον ὄρθως τὰ μετέωρα πράγματα,
εἰ μὴ ιρεμάσας τὸ νόημα οὐλεῖς τὴν φροντίδα
λεπτὴν οὐταμείξας ἐξ τὸν ὅμοιον ἀέρα. 230

Str. Tell me, who's that chap over there - him in the basket?

Pup. Himself. Str. Who's "himself"? Pup. Socrates.

Str. Hey, Socrates! You go and give him a loud call for me.

Pup. You call him yourself. I haven't got time.

Str. Hey, Socrates! Socrates, my dear chap.

Soc. Why do you call upon me, mortal?

Str. Well, first of all, I'd like to know what you're doing up there?

Soc. I am treading the air and looking down on the sun.

Str. So it's from a basket that you look down on the gods, and not from earth, is it? - if you do, that is.

Soc. I would not have found out the truth about things above if I had not suspended my thoughts on high and subtly blended my intellect with its kindred air.

A few conclusions can be drawn from this passage:

1. Socrates is seen swinging in a basket in mid-air (ἐπὶ τῆς ιρεμάθρας v. 218; οὐκ ἀπὸ τῆς γῆς vv. 226-7; ἀεροβατῶ v. 225).

Therefore in this instance a large basket must have formed part of the machine.

2. At some point after v. 237, (Str. Τὸν νῦν κατάβηθ', ω Σωκρατίδιον ως ἐμέ — be a good chap, Socrates, and come down to me.) and before v. 255, Socrates descends from his aerial position; so we may presume that the mechane was lowered so that he could step out of his basket. Since the basket is not mentioned further during the course of the play, and since its presence is no longer required, it is possible that the mechane was removed at this point — but there is no proof of this.

Peace

At the very beginning of the play the audience is made aware of Trygaeus' plan to reach the house of Zeus. From v. 80 onwards there are numerous references to his being actually en route for heaven. The chief of these are:

vv. 80-81

δεσπότης γάρ μου μετέωρος αἴρεται
ἰππηδὸν ἐς τὸν ἀέρ' ἐπὶ τοῦ κανθάρου.

My master's up there, lifted into the air on his beetle just as if he were astride a horse.

v. 92

μετεωροκοπεῖς

beating your way through the air.¹

v. 104

ως τὸν Δί' ἐς τὸν οὐρανόν

(On his way) to heaven, to Zeus.

¹I prefer this interpretation of μετεωροκοπεῖς, with Rogers, to that of Liddell and Scott, who define the verb as "prate about high things." Taken in context, and especially with regard to the presence of ποῦ, Rogers' translation makes far better sense.

vv. 124-6

Πα. οὐαὶ τίς πόρος σοι τῆς ὁδοῦ γενήσεται;
ναῦς μὲν γὰρ οὐκ ἄξει σε ταύτην τὴν ὁδόν.
Τρ. πτηνὸς πορεύσει πῶλος. οὐ ναυσθλώσομαι.

Child: How are you going to make your journey?
A ship won't be any good for this trip.

Tryg: A winged steed will carry me; I shan't go by sea.

vv. 146-8

Πα. ἔκεινο τήρει, μὴ σφαλεὶς καταρρυθῆς
ἔντεῦθεν, εἴτα χωλὸς ὡν Εύριπίδη
λόγον παράσχῃς οὐαὶ τραγῳδία γένη.

Child: Be careful you don't totter and fall off,
and then be made lame, and become a subject
for one of Euripides' tragedies.

vv. 159-161

Τρ. Ήει σαυτὸν θαρρῶν ἀπὸ γῆς,
κατὰ δρομαίαν πτέρυγ' ἔκτείνων
ὁρθὸς χώρει Διὸς εἰς αὐλάς.

Tryg: Confidence! Up we go from the earth.
Ply your swift wing and head straight for
the halls of Zeus.

vv. 173-4

Τρ. οἴμ' ὡς δέδοινα, οούνετι σηώπτων λέγω.
ὦ μηχανοποιὲ πρόσεχε τὸν νοῦν ὡς ἐμέ.

Tryg: Help! I'm scared! And I'm not joking any more.
Hey, machine-operator, have a care for me!

From these passages it can be observed that:

1. Trygaeus is actually sitting astride the dung-beetle.
2. At first he is out of sight of the audience - the slave peeps through a door or a window in the skene to see what Trygaeus is doing.
(διακύψας, v. 78).

3. Trygaeus must, however, appear within the next few verses, preparing for his flight and calming the beetle (v. 82). He probably begins his ascent around v. 109, which implies that the servant is actively trying to detain him.

4. From the daughter's concern in vv. 146-8, it appears that Trygaeus is liable to lame himself if he falls.

5. From the same verses it is obvious that Aristophanes is poking fun at Euripides, as he frequently does. In this particular case it is the subject-matter of Euripides' tragedies he is satirising. Not only this aspect of Euripides' art, however, comes within the sphere of the comic writer's comment. Throughout this scene in the Peace, where Trygaeus is preparing for and making his flight to heaven, allusions to a similar situation in Euripides' Bellerophon abound. Pegasus, the flying horse on which Bellerophon made his heavenward ascent, is referred to no less than four times here - vv. 76-7, 126, 135-6, 154. These references would put the present audience in mind of the tragedy and they would probably see a parody here of the tragic hero's position.¹

6. Trygaeus continues his ascent at v. 154 and remains in the air until v. 179, when he probably knocks on Zeus' door with the words οὐκ ἀνοίξετε. Vv. 173-4 may mark the beginning of his descent on the

¹A.C. Schlesinger, "Indications of Parody in Aristophanes," TAPhA, 1936, p. 302: "The name of Pegasos gives a strong hint as to the tragic source on which this comedy draws. A scene-parody, perhaps, begins with 82. With the mention of Euripides in 147, the hint is completed."

machine,¹ since he appears to have a rough passage at this point, but this is only conjecture. The jerking of the machinery may have been deliberate, in order to enhance the comic effect, and it does in fact call forth a little obscenity on the part of Trygaeus, with regard to his providing food for the dung-beetle.

7. The mechane was used to remove the beetle when its presence was no longer required — when the animal is summoned at v. 720, it has disappeared from the scene.

Birds vv. 1197-1202

Χο. ὥστε γγὺς ἥδη δαίμονος πεδαρσίου
δίνης πτερωτὸς φθόγγος ἐξακούεται.
Πι. αὕτη σύ, ποῦ ποῦ ποῦ πέτει; μέν' ἥσυχος,
ἔχει ἀτρέμας. αὔτοῦ στῆθ'. ἐπίσχεις τοῦ δρόμου.
τίς εἰ; ποδαπή; λέγειν ἐχρῆν ὅπόθεν πότ' εἰ.

ΙΡΙΣ

παρὰ τῶν θεῶν ἔγωγε τῶν Ολυμπίων.

Chorus: The winged sound of the whirl of a god
on high nearby greets my ears.

Peis: Hey, you! Where are you flying to, where,
I say? Stay still, don't move! Stay
right where you are! Halt your course!
Who are you? Where d'you come from?
You must say where you come from!

Iris: I come from the Olympian gods.

vv. 1217-19

Πι. οὐ πειτα δῆθ', οὔτω σιωπῆ διαπέτει
διὰ τῆς πόλεως τῆς ἀλλοτρίας καὶ τοῦ χάους;
Ιρ. ποίᾳ γὰρ ἄλλῃ χρή πέτεσθαι τοὺς θεούς;

¹Rogers suggests that Trygaeus' anxiety is caused by the exostra being pushed out beneath him to represent heaven. I find this conception of the exostra untenable. See supra pp. 17-19 on the exostra.

Peis: So you thought you'd fly secretly through this city, which doesn't even belong to you, and through chaos, did you?

Iris: By what other route are the gods to fly?

vv. 1229

Πτ. φράσον δέ τοί μοι τὰ πτέρυγε ποῦ ναυστολεῖς;

Peis: Tell me, where are you off to on your pair of wings?

The following conclusions can be drawn:

1. Iris appears in the air by v. 1199.
2. She is evidently in motion for vv. 1199 and 1200, for Peisthetaerus requests four times that she keep still.
3. After this she probably lands, but remains attached to the mechane with her wings, until her exit at vv. 1260-1.

Thesmophoriazusae vv. 1009-1014

Μν. Ξα. θεοί, Ζεῦ σῶτερ, εἰσὶν ἐλπίδες.
ἀνὴρ ξοικεν οὐ προδώσειν, ἀλλά μοι
σημεῖον ὑπεδήλωσε Περσεὺς ἐνδραμών,
ὅτι δεῖ με γίγνεσθ' Ἀνδρομέδαν. πάντως δέ μοι
τὰ δέσμους ὑπάρχει. δῆλον οὖν <τοῦτο> ξόθ' ὅτι
ἥξει με σώσων. οὐ γὰρ ἀν παρέπετο.

Mnes: Oh! Gods, saviour Zeus, there's hope yet. It seems he's not letting me down; he gave me the signal, by running out as Perseus, that I'm to be Andromeda; oh well, I've got enough chains here, anyway. Obviously he's going to come and rescue me, otherwise he wouldn't have flown by.

vv. 1098-1102

Εν. Ὡ θεοὶ τίν' ἔς γῆν βαρβάρων ἀφίγμεθα
ταχεῖ πεδίλῳ; διὰ μέσου γὰρ αἰθέρος
τέμνων κέλευθον πόδα τίθημ' ὑπόπτερον
Περσεὺς πρὸς Ἀργος ναυστολῶν τὸ Γοργόνος
κάρα κομίζων.

O gods, to what barbarian land have I come on
swift foot? Cleaving a path through the
middle of the air I, Perseus, carrying the
Gorgon's head, journey to Argos, lifting my
winged foot.

It can be noted from these passages that:

1. Once again, Aristophanes is jibing at Euripides, this time with a parody of the Andromeda.¹ Mention of Perseus, Andromeda, and the Gorgon's head makes this quite clear.
2. In vv. 1099-1100 Euripides must be flying through the air on the mechane. Whether he actually came out by means of the machine in the previous passage quoted above cannot be established with such certainty. It seems likely, however, that as the machine was used later, it was also employed for the prelude to the "rescue" scene. The comic effect and spectacle would be increased if Euripides were just wafted in and out again quickly on the mechane before actually making his appearance properly.
3. Euripides landed on the ground at some point after v. 1100. Whether he detached himself from the machine cannot be known. As to the method of his departure we have no clue.

These passages from Aristophanes do not yield much information on the nature or working of the mechane. The only component of the device which is actually mentioned is a $\tau\pi\chi\circ\varsigma$, and this suggests a

¹This passage is taken verbatim from the Andromeda - Nauck: Tragicorum Graecorum Fragmenta (Teubner. 2nd ed. 1889), frs. 123, 124.

(rope and) pulley system of some kind.¹ It is evident at least that the mechane was some form of crane, with its base situated somewhere either behind or within the skene, and it had an arm coming out over the top of the skene in order to deposit people on the stage or raise them from it. If necessary, something was attached to the arm of the crane - a basket in the case of the Clouds, and a dummy beetle in that of the Peace.

¹On the earliest date for the simple pulley (c. 870 B.C.), see A.G. Drachmann, The mechanical technology of Greek and Roman antiquity (Copenhagen: Munksgaard, 1963), p. 203.

CHAPTER V

LATER EVIDENCE ON THE MECHANE

There is comparatively little evidence on the mechane dating after the fifth century B.C. which can be of any value in an investigation into the nature and operation of the device. Brief mention should, however, be made of what little is known from sources other than Aristophanes.

A. A fragment of Antiphanes' Ποίησις¹ includes the verses:

Ἐπειθ' ὅταν μηδὲν δύνωντ' εἰπεῖν ἔτι,
κομιδῇ δ' ἀπειρήκωσιν ἐν τοῖς δράμασιν,
αἴρουσιν ὥσπερ δάκτυλον τὴν μηχανὴν,
καὶ τοῖς θεωμένοισιν ἀποχρώντως ἔχει.

Then when they can think of nothing further to say, when they are completely at a loss for words in dramas, they lift the mechane like a finger, and the spectators are satisfied.

This passage is probably referring particularly to the use of the mechane by Euripides.² Arnott says³ that ὥσπερ δάκτυλον "suggests a counterbalanced jib, with an actor dangling from the end."

It can be seen from this extract that

1. the machine was raised. The verb αἴρω signifies the action, and will be seen to recur in other places. Therefore the arm could swing up and down so as to allow the actor to be dropped or to float over various parts of the stage.

¹Kock, op.cit., Vol. II, p. 90, fr. 191, 13-16.

²For the instances in which Euripides used this device, see Hourmouziades, op.cit., p. 169. The total number he gives is: five times for certain and four times very probably.

³Op.cit., p. 73.

2. It operated like a finger, and the "arm" of the mechane could therefore probably be bent in a similar way to the joints of a finger.

B. Plato: Cratylus 425d reads:

Ὥσπερ οἱ τραγῳδοποιοὶ ἐπειδάν τι ἀπορῶσιν,
ἐπὶ τὰς μηχανὰς οἰαταφεύγουσι θεοὺς αἴροντες.

Just as the tragic poets when they are at a loss have recourse to the mechane to lift up gods.

The recurrence of the verb αἴρω is worthy of note. It appears that the mechane was primarily used to raise people or things rather than merely to hold them suspended in mid-air.

C. Plato: Cleitophon 407a reads:

καὶ μοι ἐδόκεις παρὰ τοὺς ἄλλους ἀνθρώπους οὐαλλιστα λέγειν, ὅποτε ἐπιτιμῶν τοῖς ἀνθρώποις, Ὥσπερ ἐπὶ μηχανῆς τραγινῆς θεός, ὕμνεις λέγων

And you seemed to me more than other men to speak finely when you reprove people, just like a god on the tragic mechane, and sing as follows

This extract from Plato seems to refer to the god on the mechane as a commonplace, and emphasizes the well-known use of the device in tragedy.

D. Aristotle: Poetics 1454a-b remarks:

φανερὸν οὖν ὅτι καὶ τὰς λύσεις τῶν μύθων
ἔξ αὐτοῦ δεῖ τοῦ μύθου συμβαίνειν καὶ μὴ Ὥσπερ
ἐν τῇ Μηδείᾳ ἀπὸ μηχανῆς καὶ ἐν τῇ Ἰλιάδι τὰ
περὶ τὸν ἀπόπλουν. ἀλλὰ μηχανῆς χρηστέον ἐπὶ τὰ
ἔξω τοῦ δράματος, ἥ ὅσα πρὸ τοῦ γέγονεν ἀ οὐχ
οἷον τε ἀνθρωπὸν εἰδέναι, ἥ ὅσα ὕστερον ἀ δεῖται
προαγορεύσεως καὶ ἀγγελίας.

Obviously, therefore, the dénouement of each play should come about from the plot itself and not, as in the Medea, from the mechane and as in the incident of the sailing away in the Iliad. The mechane should be used to explain what lies outside the play, either what took place previously and is therefore beyond men's knowledge, or what takes place later and needs to be foretold in an announcement.

Aristotle here criticizes dramatists for using the mechane as an easy way in which to effect the solution of a plot. It seems that he is criticizing both the actual use of the mechane (as in the Medea) and the very idea of divine intervention (as in the Iliad, Book II, vv. 155-181). He then proceeds to cite instances of what he considers the proper and appropriate use of the mechane. The implication is that the mechane had come to be used as a sort of trick device to provide an easy solution to practical difficulties, and that Aristotle disapproved of such a use.

E. Demosthenes: Oratio 40. 59 reads:

ἄλλος μὲν οὐδεὶς αὐτῷ παραγενέσθαι
μεμαρτύρηκε, Τιμοκράτης δὲ μόνος, ὥσπερ
ἀπὸ μηχανῆς, μαρτυρεῖ

No other person has testified that he was present, Timocrates alone, as if from the mechane, witnesses

Demosthenes is here ridiculing the use of the mechane for divine intervention.

F. A fragment of Alexis' Λέβης¹ reads:

εἴτ' εἰς νέωτά φησι γράψειν ορεμαμένους,
καὶ θᾶττον ἀποπέμπουσι τοὺς ὄνουμένους,
ἀπὸ μηχανῆς πωλοῦντες ὥσπερ οἱ θεοί.

¹Kock, op.cit., Vol. II, p. 342 fr. 126 vv. 17-19.

Then he says that next year he will propose (that they work) hung up, and they will send away their customers more quickly, by making their sales like gods from a mechane.

Once again, we have a reference to the machine as used for the epiphany of gods, apparently ridiculing the device. Fishmongers have previously sold their merchandise sitting down; now they are to be suspended just like gods from the mechane.

From the fourth century evidence quoted in sections A to F little can be learned about the nature of the mechane. We may imply, however, that the device was in fairly common use, since references to it are found in such a variety of authors.

G. Scholium on Aristophanes' Peace v. 80, which says:

μετέωρος δὲ αἴρεται ἐπὶ μηχανῆς. τοῦτο
δὲ καλεῖται ἐώρημα. ἐν αὐτῇ δε κατῆγον
τοὺς θεοὺς καὶ τοὺς ἐν ἀέρι λαλοῦντας.

He is raised high up, on the mechane. This (sc. thing/device) is called a ἐώρημα (i.e. something which is suspended). On it they (sc. dramatists) brought down gods and people chattering in the air.

This scholium yields the information that the mechane was used to raise gods and people in the air, and also to lower them. It thus corroborates the passages in Aristophanes where characters have been seen to come on stage by means of the mechane and to leave by the same means, viz., Birds vv. 1199-1261 and Thesmophoriazusae v. 1009.

It also gives what is apparently an alternative name for the mechane - ἐώρημα.

H. Pollux speaks of two machines which appear to have been used for similar purposes. IV, 128 mentions the mechane:

ἡ μηχανὴ δὲ θεοὺς δείκνυσι καὶ ἥρως τοὺς ἐν ἀέρι Βελλεροφόντας ἥ Περσέας, καὶ κεῖται κατὰ τὴν ἀριστερὰν πάροδον, ὑπὲρ τὴν σκηνὴν τὸ ὄψος. ὁ δὲ στὶν ἐν τραγῳδίᾳ μηχανὴ, τοῦτο καλοῦσιν ἐν οὐρανῷ οὐράνην. δῆλον δὲ ὅτι συκῆς ἐστι μίμησις. οὐράνην γὰρ τὴν συκῆν καλοῦσιν οἱ Ἀττικοί.

The mechane shows gods and heroes in the air, like Bellerophon and Perseus, and it stands by the left parodos, higher than the skene. What the mechane is in tragedy is called οὐράνη (fig-branch) in comedy. Obviously (this is) because it is an imitation of a fig-branch; the people of Attica call the συκῆ, οὐράνη.

IV 130 mentions the γέρανος:

ἡ δὲ γέρανος μηχάνημά ἐστιν ἐκ μετεώρου καταφερόμενον ἐφ' ἀρπαγῆ σώματος, ὃ κέχρηται Ἡώς ἀρπάζουσα τὸ σώμα τὸ Μέμνονος. αἰώρας δὲ ἀν εἴποις. τοὺς κάλως, οἵ κατήρτηνται ἐξ ὄψους ὡς δινέχειν τοὺς ἐπὶ τοῦ ἀέρος φέρεσθαι δοκοῦντας ἥρως ἥ θεούς.

The crane is a device brought down from on high to seize a body; it was used by Dawn in snatching away the body of Memnon. One may call the ropes, which were fastened from a high (spot) in order to hold up the heroes or gods, who appeared to be borne into the air, αἰώρας.

A few observations can be made on these two passages:

1. It is possible that Pollux derived his idea of the use of the mechane for portraying "people like Bellerophon and Perseus" directly from either the tragedies of Euripides or the comedies of Aristophanes. This statement agrees with what is known of the situations in both cases.

2. Pollux states that the mechane was situated by the left parodos. It is not clear whether he means the left side facing the audience, or looking towards the stage; but this is of little consequence. The main point is that it is highly doubtful whether Pollux was in a position to make so definite an observation about a theatre of six centuries before his time.

3. The mechane of tragedy is the equivalent of the *krade*¹ in comedy. Although we have no fifth century statement to this effect, the idea recurs in later sources.² The statement in Pollux may refer to the machine being "disguised" as a fig-branch.

4. The machine called the *geranos*³ is "brought down from on high" just as was the mechane. The reference to its use in the Psychostasia, a lost play of Aeschylus, means little to us save that it was employed to lift a body, and that it already carried Dawn; therefore it could bear the weight of two bodies.

5. Ropes were used in the operation of the *geranos*.

6. The *geranos* was used to show heroes and gods in the air. (cf. IV 128 on the mechane).

The two contrivances, the mechane and the *geranos*, sound so much alike from Pollux's description that it is perhaps surprising to find that he does not identify one with the other. He actually states that

¹Hereafter given its transliterated form.

²See infra, pp. 37, 38.

³Hereafter given its transliterated form.

both were employed to show gods and heroes in the air; and there is nothing in his description of either device which conflicts with any item given in his description of the other.

One further piece of information Pollux gives us on the mechane is incidental to his description of the form and function of the περίαντοι¹ in IV 126:

[sc. ἡ περίαντος] καὶ θεούς τε θαλαττίους ἐπάγει, καὶ πάνθ' ὅσα ἐπαχθέστερα ὄντα ἡ μηχανὴ φέρειν ἀδυνατεῖ.

And it brings on gods from the sea too, and anything which is too heavy for the mechane to carry.

Here it is implied that the mechane could not carry an unlimited load. Whether this statement refers to the machine as Pollux knew it in the theatre of his own day, or whether he is speaking of the kind of machine genuinely in use in the fifth century B.C., is difficult to tell. It seems likely that he is not speaking of his own times, for the compound pulley, which would be capable of lifting far heavier loads than the simple pulley, was known by about 300 B.C.²

I. Pseudo-Plutarch: Paroem. II, 16.³

¹These appear to have been revolving prisms with three faces, the purpose of which was to effect a visible change of scene. There is no evidence for their use in the Classical period of Greek drama.

²See Drachmann, op.cit., p. 204.

³Corpus Paroemigraphorum Graecorum, ed. E.L.A. Leutsch and F.G. Schneidewin (Hildesheim: Georg Olms Verlagsbuchhandlung, 1958), Vol. I., p. 338.

κράδης ράγείσης: κράδη νῦν οὐχ ὁ σύνηινος
κλάδος, ἀλλ' ἡ ἀγκυρὶς, ἀφ' ἣς οἱ ὑποκριταὶ
ἐν ταῖς τραγιναῖς σκηναῖς ἔξαρτῶνται,
θεοῦ μιμούμενοι ἐπιφάνειαν, ζωστῆρσι καὶ
ταινίαις κατειλημένοι.

"The breaking of the krade": krade here is not the fig-branch, but the hook from which actors in tragedies are suspended, imitating the epiphany of a god, wrapped up in belts and bands.

This passage asserts that the krade was a hook. Pollux, however, says that it is in comedy that the device (i.e. the mechane) was called a krade. Here we are told that it was a hook which was thus named in tragedy. The probability is that the same machine was used in both cases, and the discrepancy we have here is of little importance.

J. Hesychius, s.v. γέρανος reads (inter alia):

γέρανος καὶ ἐν τῇ σκηνῇ ἄρπαξ
κατεσκευασμένος ὑπὸ τοῦ μηχανοποιοῦ, ἐξ οὐ
ὅ [ἐσκευασμένος] ὑποκριτὴς τραγῳδεῖ.

A crane is also a hook in the skene, fixed up by the machine-operator, from which the [dressed-up] actor declaims.

This definition offers no further explanation of the nature or operation of the device. Although there are several different definitions in Hesychius of the term mechane, none of them refers to stage machinery. It may be that both terms, mechane and geranos, refer to the same theatrical device and that by the time Hesychius was writing, the word geranos to denote the device had superseded the word mechane.

Hesychius seconds Pseudo-Plutarch in his definition of the krade:

κράδη: συνῆ. ολάδος. οὐαὶ ἀγκυρίς, ἐξ ἣς
ἀνήπτοντο οἱ ἐν ταῖς τραγιναῖς μηχαναῖς
ἐπιφανόμενοι.

Fig-branch. Young shoot. Also a hook onto which people
who appeared on the machines in tragedy were fastened.

It is possible that Hesychius used both Pollux and Pseudo-Plutarch
as sources.

The conclusions reached from this investigation into later sources
on the mechane are:

1. It was usually, but not exclusively, used for raising someone and putting him down on the stage.
2. It showed gods and heroes in the air.
3. It was located by the left parodos.
4. It was also known, at some period, by the names eorema and krade.
5. It is most probably to be identified with the geranos, and therefore has ropes and a hook from which people were suspended.
6. It was ridiculed enough for its use to become proverbial.

Of these conclusions, 1 and 2 confirm the deductions already made from the fifth century sources;¹ 3 and 4 are not supported by earlier evidence in any way, and cannot therefore be regarded as valid conclusions as regards the theatre of the fifth century B.C.; 5 supports the idea of the pulley system for the operation of the mechane, when taken

¹supra, chap. IV.

in conjunction with the testimony of the fragment quoted in section A. of this chapter. 6 is deduced from fourth century sources.¹

Thus we are left with the knowledge that in the fifth century B.C. the mechane was most probably operated after the manner of a simple pulley, and its function was to raise people from behind or within the skene and then lower them onto the stage, and to portray people either suspended motionless or actually moving in the air.

¹supra, pp. 31-33.

CHAPTER VI
THE PURPOSE AND EFFECT OF THE DEVICES IN
ARISTOPHANES' COMEDIES

An investigation should now be made into Aristophanes' purpose in using the two devices discussed above.

First of all, was it necessary for him to use them? In the case of the ekkuklema, I think it may safely be said that the scenes in the Acharnians and the Thesmophoriazusae could equally well have been performed without the use of the machine. A brief look at the two passages should suffice to prove the point.

The Acharnians.

The basic situation is that Dicaeopolis calls on Euripides, who has not time to come down to see him. Instead of Euripides being circled out, the whole scene could have been played with him at an upstairs window. The use of the ekkuklema is not necessary in any way.

The Thesmophoriazusae.

Here Euripides and Mnesilochus visit Agathon, who comes out (*Εξέπχεται*, v. 95) of his house. He could have come out in a number of different ways: he could have walked out, run out, been carried out.¹ He just happens to come out on the ekkuklema because this was how Aristophanes willed it. The use of the machine was not strictly necessary.

¹At an outdoor production of this play by the Oxford University Dramatic Society in the grounds of Magdalen College two years ago, Agathon was carried on, sitting in a chair, by two slaves.

The employment of the machine was therefore not a pre-requisite for the staging of the comedies. Why, then, did Aristophanes include it? If we bear in mind that the main objective of Aristophanic comedy is fun,¹ where can we look for the source of the humour? It surely cannot be mere coincidence that Euripides, and therefore tragedy,² is involved to such an extent in both situations where Aristophanes makes such elaborate use of the ekkuklema? Aristophanes constantly makes fun of Euripides in other ways, and frequently alludes to him, as well as to tragedy. It seems therefore that the use of the ekkuklema must be deliberate, and intended to parody not Euripides' metrics, nor his background, nor his ideas, but his methods, his fondness of the spectacular.

The function of the ekkuklema in tragedy was, to quote K.J. Dover,³ to present before the audience "people who were dead, sick, unconscious, wounded, mad, brooding, fettered or otherwise immobilised."⁴ By virtue of the nature of his art, Aristophanes did not need to portray such tableaux as the tragedians had to show — the ἀπόρρητα πραχθέντα (unspeakable deeds) referred to by Pollux. Instead, he employed the

¹On this, see W.B. Stanford, ed., The Frogs. (London: Macmillan & Co., Ltd. 2nd. ed., 1963), Introduction, xxxiii-xxxviii.

²This idea is supported by the inclusion of Agathon, another tragic poet, in the ekkuklema scene in the Thesmophoriazusae.

³Op.cit., p. 6.

⁴Such tableaux would nowadays be revealed by raising a curtain or by lighting effects, neither of which resources was available to the Greek producer.

machine in the representation of the tragic dramatists themselves.

They are, so to speak, hoist with their own petard.

The audience would be familiar with the ekkuklema as used in tragedy, and thus would appreciate the parody of the device in Aristophanes' comedies. In the case of the ekkuklema, it appears to be simply the employment of the machine which Aristophanes parodies. Can the same be said with regard to the mechane?

Firstly, let us examine whether the mechane is or is not required in the instances where it is used by Aristophanes.¹ It seems to me that in no case is the machine absolutely necessary.² Socrates, in the Clouds, could have been situated above the stage level, at the top of some steps, for example, in order to look down upon things below; Trygaeus' flight to heaven in the Peace need not have been portrayed on stage; Iris, in the Birds, could have walked on stage, saying that she had come from heaven; Euripides, as Perseus in the Thesmophoriazusae, could have run into view along a wall, or a raised surface of some kind on stage, and then descended to stage level to effect the rescue of Mnesilochus.³ The scenes could have been staged in these, or other

¹For the passages where it is used, see supra, chap. IV.

²I leave aside here the Daedalus passage, since we do not know its context, and are therefore not in a position to judge whether the mechane was or was not a necessity.

³At the production mentioned supra, p. 40, this incident was staged by Euripides running along a wall, which formed the 'skene,' and down a ladder to 'stage' level.

ways, but Aristophanes chose to use the mechane. Why? Again, I think the answer is: for the sake of parody. And here I think we can distinguish two categories of parody.

There is parody simply of the employment of the contrivance.¹ There is also, however, a slightly different type of parody, viz., that consisting of travesty of a particular situation in a specific play. Here the method by which Aristophanes hints at what is to come is distinctive.² Either before or during the parodied passage itself, he introduces mention of one or more characters in the original play on which he is drawing. Examples of this technique are Peace vv. 76-77 and Thesmophoriazusae vv. 1098-1102. In such cases as these, the members of the audience who had seen the original tragedies could doubly appreciate the humour of the comic situation.

Not only does Aristophanes travesty the use of the device; he even goes out of his way to call attention to the illusion thereby created, by reference to the machine-operator.³ He deliberately focuses the thoughts of the spectators on the fact that the flight is only an illusion, a spectacle of the theatre. In the Peace, Trygaeus' plea to the

¹Such passages are Clouds vv. 218ff. and Birds vv. 1197ff. The idea is supported by the passages of Antiphanes and Plato quoted supra pp. 30-31 in both of which it is asserted that the device is used by tragic poets when they are at a loss for words — obviously a jibe.

²For the various means used by Aristophanes to signify parody, see A.C. Schlesinger: "Identifications of parodies in Aristophanes" AJP 58, 1937, pp. 294-305.

³So in Daedalus fr. 188 and Peace 174.

μηχανοποιός must have added further amusement to that already caused by the ludicrous sight of him swinging in mid-air on the back of a dung-beetle.

The purely visual aspect of the use of the two devices should not be forgotten. The mere sight of someone appearing circling out from the back-scene, or of someone swinging in a basket or sitting astride an animal in mid-air provides an entertaining spectacle even today. It is, we might say, a "spectacular." The Greek theatre of the fifth century B.C. depended to a large extent on visual stimulus. The masks worn by actors, the padded and grotesque costumes of comedy, the use of stage machinery, all increased the impact of the drama.

In default of positive proof of Aristophanes' purpose in using the contrivances, we are forced to fall back on what seems to be the most plausible reason. I conclude that:

1. the devices were employed by the tragedians to fill a need;
2. once introduced, they may have been used when they were not really required, as well as when their use was justified;
3. the comic effect of Aristophanes' plays was enhanced by the spectacle and illusion created by the use of the devices;
4. comedians and other writers made jokes at the expense of the tragic poets, and that this continued well into the fourth century is demonstrated by the extracts from Plato, Aristotle, and Antiphanes.

CHAPTER VII

CONCLUSION

Having surveyed the extant evidence on the ekkuklema and the mechane from Aristophanes and later sources, I draw the following conclusions:

1. The ekkuklema was most probably a semi-circular platform, whose back-scene was formed by part of the front wall of the skene, and which revolved out of the skene on a pivot and, perhaps, wheels. Its purpose in the comedy of Aristophanes was the achievement of comic effects by parody of its employment by the tragic poets, especially Euripides.
2. The mechane was a type of crane, probably operated on the system of a simple pulley, using ropes and a wheel. Its purpose was to represent people in the air. In the plays of Aristophanes it provided in effect a burlesque of tragedy, but possibly provoked laughter even just on its appearance. Spectators unable for any reason to appreciate the more subtle element of humour, viz. the parody,¹ would doubtless nevertheless have been able to enjoy the more immediate, visual, comic effect it produced.

¹Such spectators would probably be in the minority. On the familiarity of the ancient audience with tragedy and lyric poetry, see W.B. Sedgwick: "The Frogs and the audience," C&M IX, 1947, 1-9.

Fig. 1. Diagram to show the three positions of the ekkuklema, working on a pivot (aerial view).

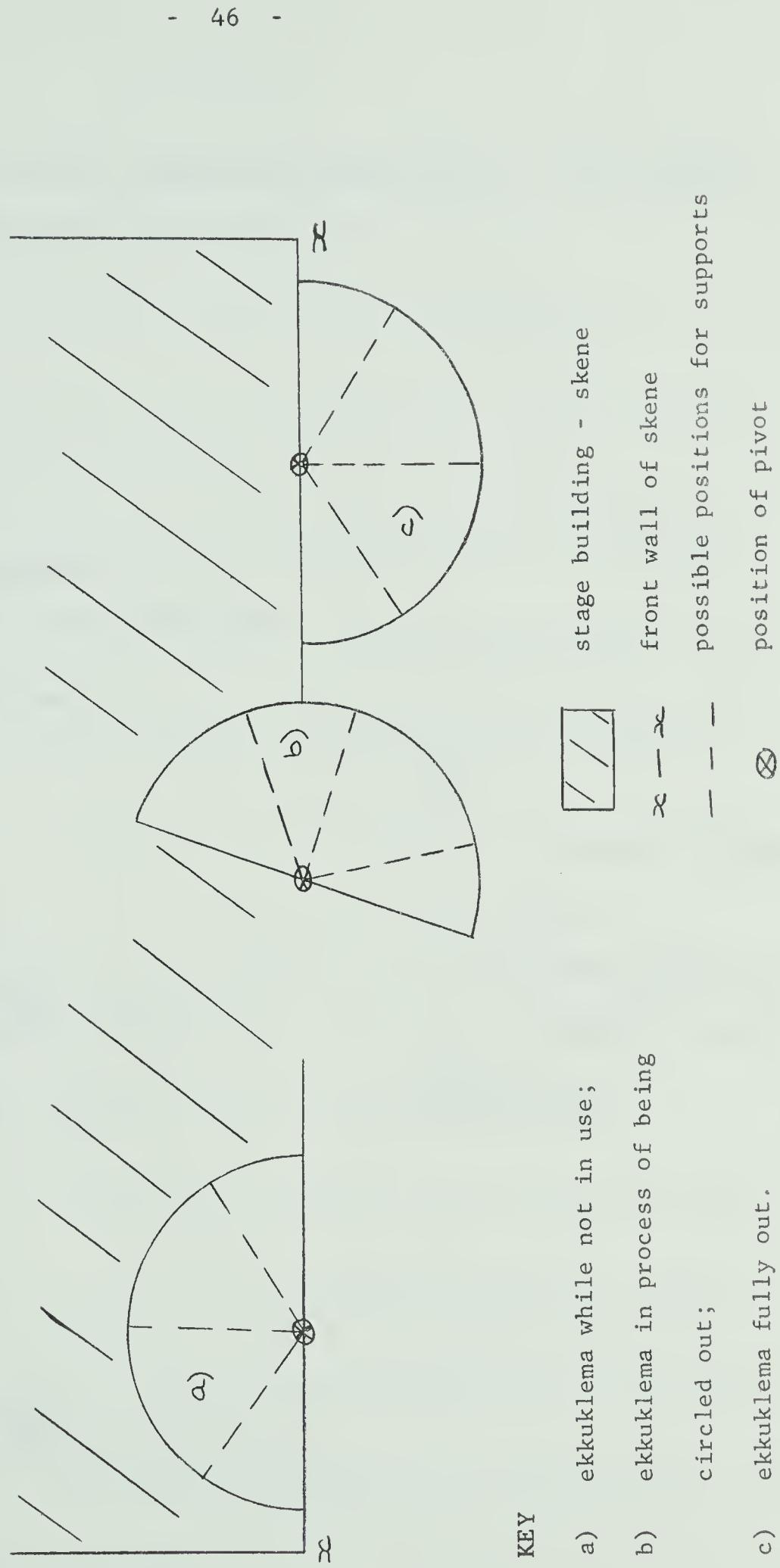
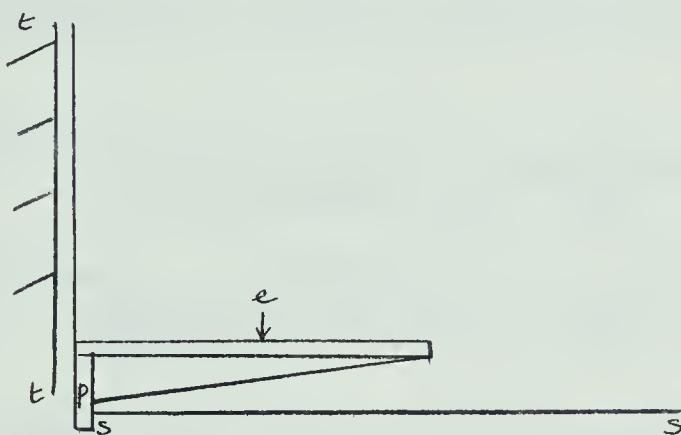
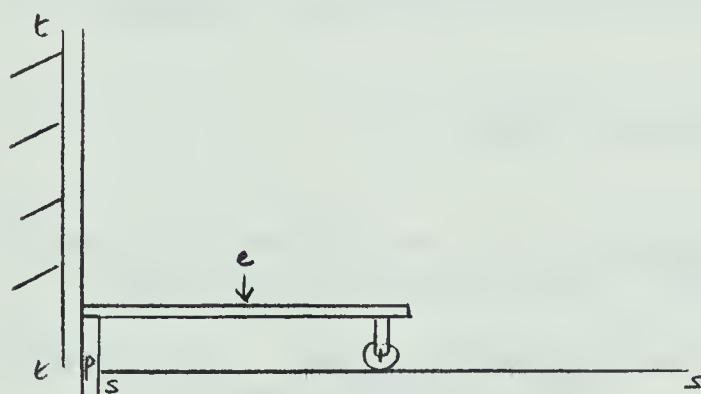


Fig. 2. Cross section of stage and stage building to show ekkuklema

a) on pivot and supports (as in fig. 1)



b) on pivot and wheels.



KEY

t - t front wall of skene

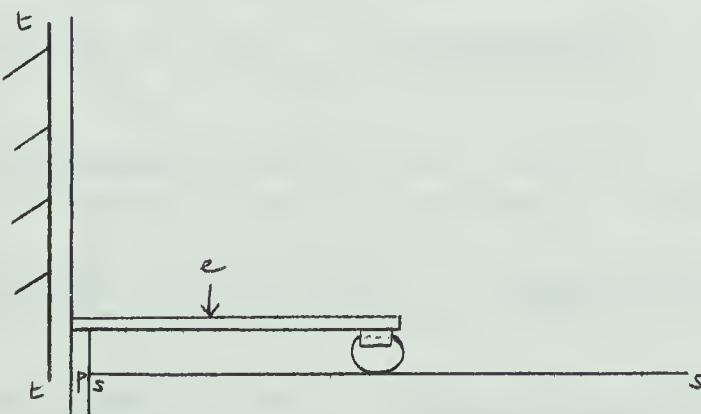
p pivot

s - s ground (stage) level

e ekkuklema platform



c) on pivot and castors.



BIBLIOGRAPHY

A. REFERENCE WORKS

Abbreviations used correspond to those found in Marouzeau.

Cary, M. et. al. (eds.) The Oxford Classical Dictionary. Oxford: at the Clarendon Press, 1961.

Daremburg, C. and Saglio, E. (comps.) Dictionnaire des antiquités grecques et romaines. Graz: Akademische Druck -u. Verlagsanstalt, 1963.

Liddell, H.G. and Scott, R. (comps.) A Greek-English Lexicon. Ninth edition. Oxford: at the Clarendon Press, 1966.

Pauly-Wissowa. Real-Encyclopädie der classischen Altertumswissenschaft. Stuttgart: J.B. Metzlersche Buchhandlung, 1893.

B. TEXTS AND ANCIENT WORKS

Allen, J.T. and Italie, G. A Concordance to Euripides. London: Cambridge University Press, 1954.

Bétant, E-A. Lexicon Thucydideum I. Hildesheim: Georg Olms Verlagsbuchhandlung, 1961.

Bethe, E. (ed.) Pollucis Onomasticon, Fasc. I. Leipzig: B.G. Teubner, 1900.

Burnet, J. (ed.) Platonis Opera. Oxford: at the Clarendon Press, Vol. I. 1961; Vol. IV, 1962.

Butterworth, G.W. (trans. and ed.) Clement of Alexandria: The Exhortation to the Greeks. London: William Heinemann, 1919.

Dübner, Friedrich (ed.) Scholia Graeca in Aristophanem. Michigan: Ann Arbor University Microfilms, Inc., 1959.

Dürrbach, F. (ed.) Inscriptiones Graecae. Vol. XI, Fasc. II. Inscriptiones Deli. Berlin: George Reimer, 1912.

Ebeling, H. Lexicon Homericum, Vol. I. Hildesheim: Georg Olms Verlagsbuchhandlung, 1963.

Ellendt, F. Lexicon Sophocleum. Berlin: Borntraeger Bros., 1872.

Essen, M.H.N. von. Index Thucydideus. Darmstadt: Wissenschaftliche Buchgesellschaft, 1964.

Fatouros, G. Index Verborum zur fr̄hgriechischen Lyrik. Heidelberg: Carl Winter, 1966.

Hall, F.W. and Geldart, W.M. (eds.) Aristophanis Comoediae. Vol. I, 1949, Vol. II, 1951. Oxford: at the Clarendon Press.

Hamilton Fyfe, W. (ed. and trans.) Aristotle. The Poetics. London: William Heinemann Ltd., 1932.

Italie, G. Index Aeschyleus. Leiden: E.J. Brill, 1964.

Kock, Theodorus (ed.) Comicorum Atticorum Fragmenta. Vol. I, 1880. Vol. II, 1884. Leipzig: B.G. Teubner.

Lane, Mary C. Index to the fragments of the Greek Elegiac and Iambic Poets. Michigan: Ann Arbor University Microfilms, Inc., 1962.

Latte, Kurt (ed.) Hesychii Alexandrini Lexicon, Vol. II. Copenhagen: Ejnar Musksgaard, 1966.

Leutsch, E.L. and Schneidewin, F.G. (eds.) Corpus Paroemigraphorum Graecorum. Hildesheim: Georg Olms Verlagsbuchhandlung, 1958, Vol. I.

Nauck, Augustus (ed.) Tragicorum Graecorum Fragmenta. Leipzig: B.G. Teubner, 1889.

Paulson, J. Index Hesiodeus. Hildesheim: Georg Olms Verlagsbuchhandlung, 1962.

Powell, J.E. A Lexicon to Herodotus. Hildesheim: Georg Olms Verlagsbuchhandlung, 1960.

Rennie, W. (ed.) Demosthenis Orationes. Oxford: at the Clarendon Press, 1920.

Rogers, Benjamin B. The Comedies of Aristophanes. Vol. II, 1930. Vol. IV, 1911. London: G. Bell and Sons, Ltd.

Rumpel, J. Lexicon Pindaricum. Hildesheim: Georg Olms Verlagsbuchhandlung, 1961.

Stählin, Otto (ed.) Clemens Alexandrinus, Vol. I. Protrepticus und Paedagogus. Leipzig: J.C. Hinrichssche Buchhandlung, 1936.

Stanford, W.B. Aristophanes: The Frogs. London: Macmillan and Co., Ltd. 2nd ed., 1963.

Starkie, W.J.M. (ed.) The Acharnians of Aristophanes. London: Macmillan and Co., Ltd. 1909.

_____. The Clouds of Aristophanes. Amsterdam: Adolf M. Hakkert, 1966.

Todd, O.J. Index Aristophaneus. Hildesheim: Georg Olms Verlagsbuchhandlung, 1962.

C. MODERN WORKS

Allen, James T. Stage Antiquities of the Greeks and Romans and their influence. New York: Cooper Square Publishers, Inc., 1963.

_____. The Greek Theater of the Fifth Century Before Christ. Berkeley: University of California Press, 1919.

Arnott, Peter D. An Introduction to the Greek Theatre. Bloomington: Indiana University Press, 1963.

_____. Greek Scenic Conventions. Oxford: at the Clarendon Press, 1962.

Benveniste, E. Origines de la formation des noms en Indo-Européen. Paris: Librairie d'Amérique et d'Orient, Adrien-Maissonneuve, 1962.

Bieber, Margarete. The History of the Greek and Roman Theater. Princeton: Princeton University Press, 1961.

Boisacq, Emile. Dictionnaire étymologique de la langue grecque. Heidelberg: Carl Winters Universitätsbuchhandlung, 3rd ed., 1938.

Chantraine, Pierre. Etudes sur le vocabulaire grec. Paris: Librairie C. Klincksieck, 1956.

Dörpfeld, W. and Reisch, E. Das griechische Theater. Athens: Verlag Barth und von Hirst, 1896.

Drachmann, A.G. The Mechanical Technology of Greek and Roman Antiquity, Copenhagen: Munksgaard, 1963.

Flickinger, Roy C. The Greek Theater and its drama. Chicago: University of Chicago Press, 4th ed., 1965.

Frisk, Hjalmar: Griechisches Etymologisches Wörterbuch. Heidelberg: Carl Winters Universitätsverlag, 1960.

Haigh, A.E. The Attic Theatre. 3rd ed., (revised by A.W. Pickard-Cambridge). Oxford: at the Clarendon Press, 1907.

Hourmouziades, Nicolaos C. Production and Imagination in Euripides. Athens: Greek Society for Humanistic Studies, 1965.

Lever, Katherine. The Art of Greek Comedy. London: Methuen and Co., Ltd., 1956.

Mantzius, K. A History of Theatrical art in ancient and modern times. Vol. I, The earliest times. (trans. L. von Cossel) New York: Peter Smith, 1937.

Pickard-Cambridge, Sir Arthur W. The Theatre of Dionysus in Athens. Oxford: at the Clarendon Press, 1946.

Webster, T.B.L. Greek Theatre Production. London: Methuen and Co., Ltd, 1956.

Wilamowitz-Möllendorff, Tycho von. Die dramatische Technik des Sophokles. Berlin: Weidmannsche Buchhandlung, 1917.

D. PERIODICALS

Bethe, E. "Ekkyklema und Thyroma," RhM, LXXXIII, 1934, 21-38.

Bieber, Margarete. "The entrances and exits of actors and chorus in Greek plays," AJA, LVIII, 1954, 277-284.

Capps, Edward. "The Greek stage according to the extant dramas," TAPhA, XXII, 1891, 5-80.

Dale, A.M. "An interpretation of Aristophanes' Vespa 136-210 and its consequences for the stage of Aristophanes," JHS, LXXVII, 1957, 205-211.

_____. "Seen and unseen on the Greek stage: a study in scenic conventions," WS, LXIX, 1956, 96-106.

Dover, K.J. "The skene in Aristophanes," PCPhS, No. 192, 1966, 96-106.

Exon, Charles. "A new theory of the eccyclema," Hermathena, XI, 1900, 132-143.

Fossum, Andrew. "The eiskyklema in the Eretrian theatre," AJA, 2nd series Vol. 2, 1898, 187-194.

Gardner, P. "The scenery of the Greek stage," JHS, XIX, 1899, 252-264.

Rees, K. "The function of the προθύρον in the production of Greek plays," CPh, X, 1915. 117-138.

Robert, C. "Die Scenerie der Eirene," Hermes, XXXI, 1896, 551-561.

Schlesinger, A.C. "Indications of parody in Aristophanes," TAPhA, LXVII, 1936. 296-314.

_____. "Identification of parodies in Aristophanes," AJPh, LVIII, 1937. 294-305.

Sedgwick, W.B. "The Frogs and the audience," C&M, IX, 1947. 1-9.

Webster, T.B.L. "South Italian vases and Attic drama," CQ, XLII, 1948. 15-27.

B29900